Specification

At page 1, line 9, please insert the following:

--STATEMENT REGARDING FEDERALLY SPONSORED RESEARCH OR DEVELOPMENT

A1

This invention was made with U.S. Government support under Contract No. ASC-8920219 awarded by the National Science Foundation. The Government may have certain rights in this invention.--

At page 15, line 17, please amend equation (4) as follows:

A2

$$--I_p(x,\theta_p,\phi_p) = \frac{L(x,\theta,\phi)d(x)^2}{\underline{g(x,\theta,\phi)}k_u(x)\cos(\theta_p)} \qquad (4)--$$

At page 16, please amend the paragraph beginning at line 20 as follows:

A3

--For a single-pass rendering, we treat the ~~location 133~~ location 132 of the user as the shading **view**. Then, the image rendering process involves rendering the scene from the projector's view, by using a perspective projection matrix that matches the projector's intrinsic and extrinsic parameters 401, followed by radiance adjustment as described above.--

At page 20-21, please amend the paragraph beginning at line 24 of page 20 as follows:

-- First, we approximately position each of the projectors 160-161, generally, illuminating device, so that projected images would substantially illuminate the physical object 101. Next, for each projector, we illuminate the 3D physical object 101 with a calibration cross-hair 403. An input device 402 is used to align the projected cross-hair 403 with each of the selected 3D calibration points 112 of the physical object 101 in turn. This determines the coordinates of the corresponding 2D calibration pixels 114, i.e., the pixel at the exact center of the cross-hair 402. We then adapt the geometric relationship between the 3D and 2D points to determine the projector's intrinsic and extrinsic parameters 401 from the rigid transformation between the coordinate systems of the object and the projectors. The transform is in the form a 3x4 perspective projection matrix up to scale, which is decomposed to find the intrinsic and the extrinsic parameters 401 of the projectors, see Faugeras "*ThreeDimensional Computer Vision: A Geometric Viewpoint*," MIT Press, Cambridge, Massachusetts, 1993. The rendering step 130 uses the same internal and external parameters 401, so that the projected images 151 are exactly registered with the physical object 101, even if the projectors are approximately ~~positions~~ positioned with respect to the 3D physical object 101.--

A4

At page 22, please amend the paragraph beginning at line 1 as follows:

-- The resultant intensities of the pixels vary smoothly across curved surface due to shading interpolation and inversely proportional to a factor $\frac{d(x)^2}{k_u(x)\cos(\theta_p)}$. If the illumination device 160 has a limited dynamic range, we only illuminate portions

A5

of the surface ~~with~~ when the direction of the radiance with respect to the surface is at an angle $\theta_p < 60$ because at greater angles $1/\cos(\theta)$ ranges from two to infinity. This avoids a low sampling rate of the projected pixels on severely oblique portion of the surface. This also minimizes mis-registration artifacts due to any errors in the geometric registration 400. During the calculations to locate overlap regions, described below, severely oblique portions of the surface are considered not to be illuminated by any projector, i.e., these are in the "shadow."--

AS
CMC